PHYS 7895   Fall 2013
Introduction to Quantum Information Theory
Homework 3

Due Tuesday 29 October 2013, by 5pm in Nicholson 447
(You are allowed to work with others as long as you write down who your collaborators are.
Any late assignments will be penalized in the amount of 25% per day late.)

This assignment has a first part and a second part.

First part: Exercises in **arXiv:1106.1445**:

5.1.3, 5.1.4, 5.2.11, 5.4.1, 6.2.3, 6.2.4, 6.2.6, 7.2.3, 7.4.3, 7.4.4, 9.1.1, 9.2.5, 9.2.6

Second part: The following exercises:

1. Prove that the minimal number of Kraus operators needed in any Kraus representation
   of a quantum channel is equal to the rank of the Choi matrix of that channel.

2. Prove that a linear map is completely positive if and only if its corresponding Choi
   matrix is positive.